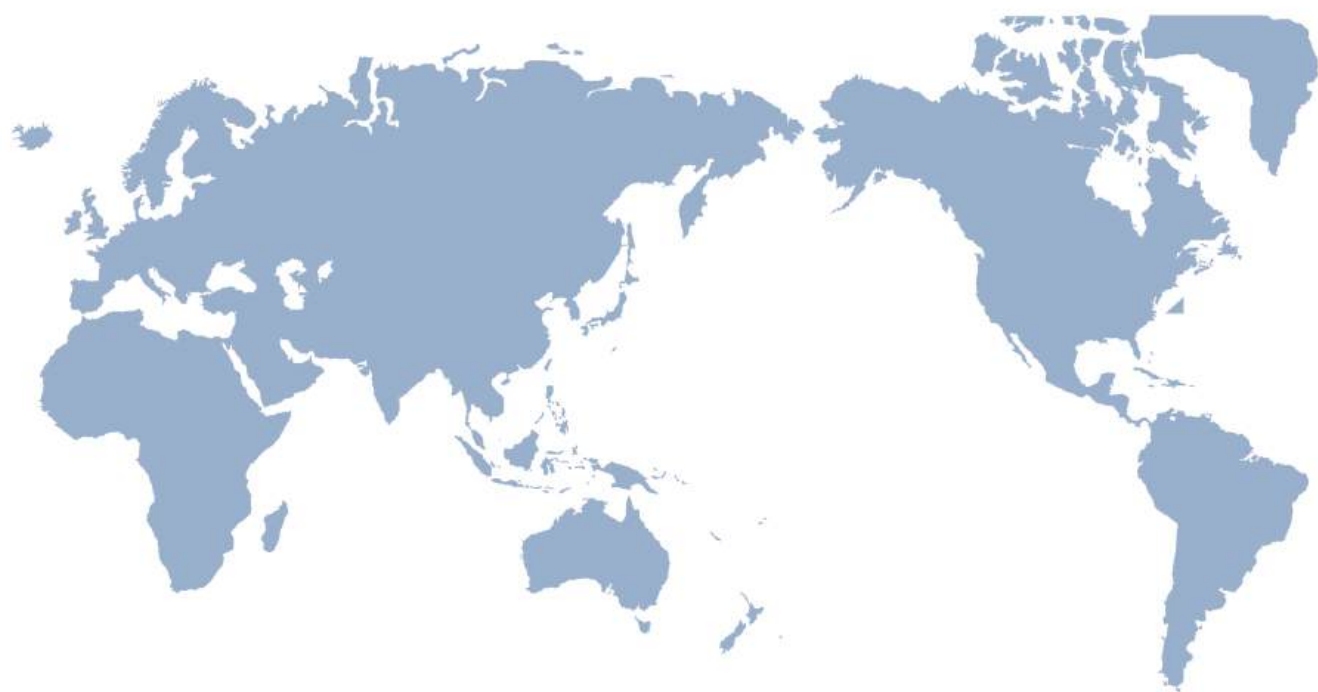
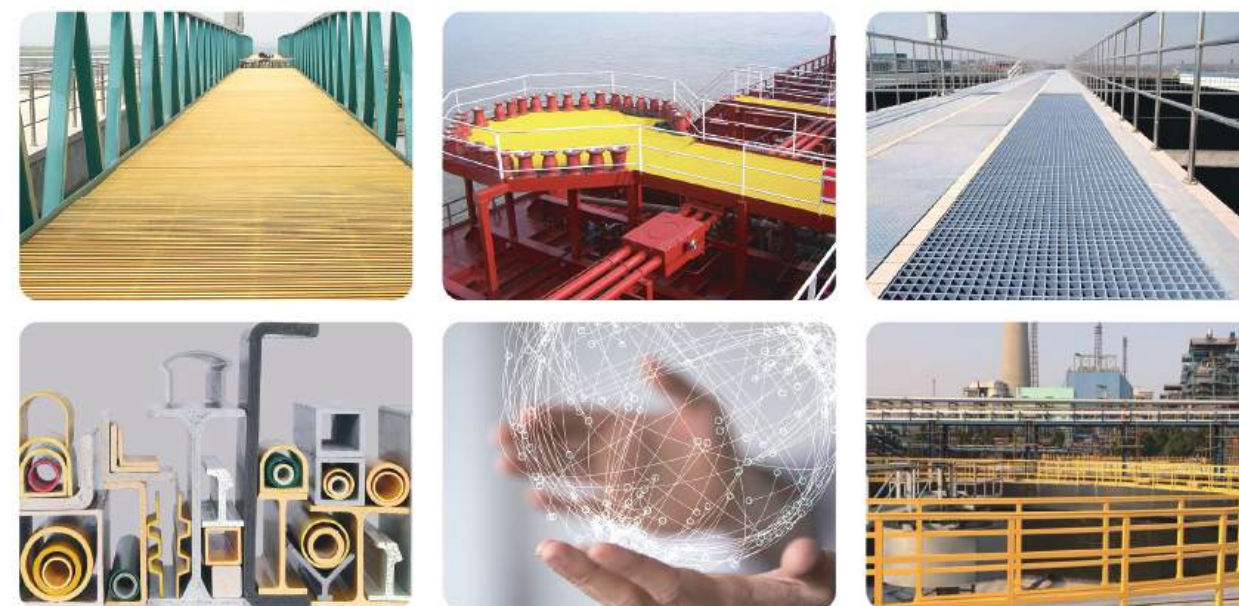


美固，专注于耐腐蚀环保复合材料的综合解决方案

Nantongrate, focused on corrosion environment comprehensive solution of the composite material



美固新材料（南通）有限公司

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美固新材料（南通）有限公司

NANTONG COMPOSITE MATERIAL CO.,LTD

关于美固

美固新材料（南通）有限公司，坐落于临江靠海的江苏省南通市苏通科技产业园，注册资本 3800 万美元，致力于高性能纤维复合制品的研发、生产及销售。

公司前身南通美固复合材料有限公司，成立于 2003 年 4 月，依托人才、技术、渠道积累，不断扩大规模，现有各类员工 200 余人，占地面积近 100 亩，年产能 10000 吨以上。

美固是一家集研、产、销为一体的高新技术产品制造及服务企业，拥有多项技术专利，参与起草《玻璃纤维增强热固性树脂承载型格栅》国家行业标准、《结构用纤维增强复合材料拉挤型材》国家标准、《地铁隧道疏散平台》国家团体标准，是南通市城市轨道交通用复合材料工程技术研究中心。

美固管理规范，严格按照管理体系进行生产、管理，不仅在技术研发处于国内领先水平，同样在作为产品质量生命线的实验检测设备上投入巨大，拥有齐全的质量检测设备（TG 测试仪、电子万能试验机、热值仪等），确保产品技术工艺领先、质量优异。

不断的创新，更多的专注，是美固的实力得以展现的必要基础。坚持质量创造价值，专业引导市场的经营理念，客户是企业生存和发展的根基，满足客户不断发展的需要、做客户最好的成长伙伴是美固永恒的追求。

美国人正以发展的眼光，创新的精神，积极的态势恭候您的垂询。



不断的创新，更多的专注，是美固的实力得以展现的必要基础

Continuous innovation and more focus are the necessary basis for Nantong Composite to show its strength

坚持质量创造价值，专业引导市场的经营理念

Adhere to the business philosophy of quality creating value and professional guiding the market

客户是企业生存和发展的根基，满足客户不断发展的需要

Customers are the foundation for the survival and development of an enterprise, and meet the needs of customers for continuous development

做客户最好的成长伙伴是美固永恒的追求

To be the best growth partner of customers is Nantong Composite eternal pursuit



About Nantongrate

Nantong Composite Material CO.,LTD . is located in Jiangsu Nantong Science and Technology Industrial Park, which is near the river and near the sea. With a registered capital of 38 million dollars, it is committed to the research, development, production and sales of high-performance fiber composite products.

The predecessor of the company, Nantong Composite Material CO.,LTD . was established in April 2003. Relying on the accumulation of talents, technologies and channels, the company continues to expand its scale. At present, it has more than 200 employees, covers an area of nearly 100 mu, and has an annual production capacity of more than 10000 tons.

Nantong Composite is a high-tech product manufacturing and service enterprise integrating research, production and marketing. It has a number of technical patents, participated in drafting the national industry standards of Glass Fiber Reinforced Thermosetting Resin Bearing Grating, the national standards of Fiber Reinforced Composite Extrusion Profiles for Structure, and the national group standards of Metro Tunnel Evacuation Platform. It is the Nantong Urban Rail Transit Composite Engineering Technology Research Center.

Nantong Composite has standardized management and strictly followed the management system for production and management. It not only leads in technical research and development in China, but also invests heavily in experimental detection equipment as the lifeline of product quality. It has complete quality detection equipment (TG tester, electronic universal tester, calorific value meter, etc.) to ensure that the product technology is leading and the quality is excellent.

Continuous innovation and more focus is the necessary basis for Nantongrate to show its strength. Adhering to the business philosophy of "quality creates value and professional guides the market", customers are the foundation for the survival and development of the enterprise, and it is Nantongrate's eternal pursuit to meet customers' needs for continuous development and be the best growth partner of customers.

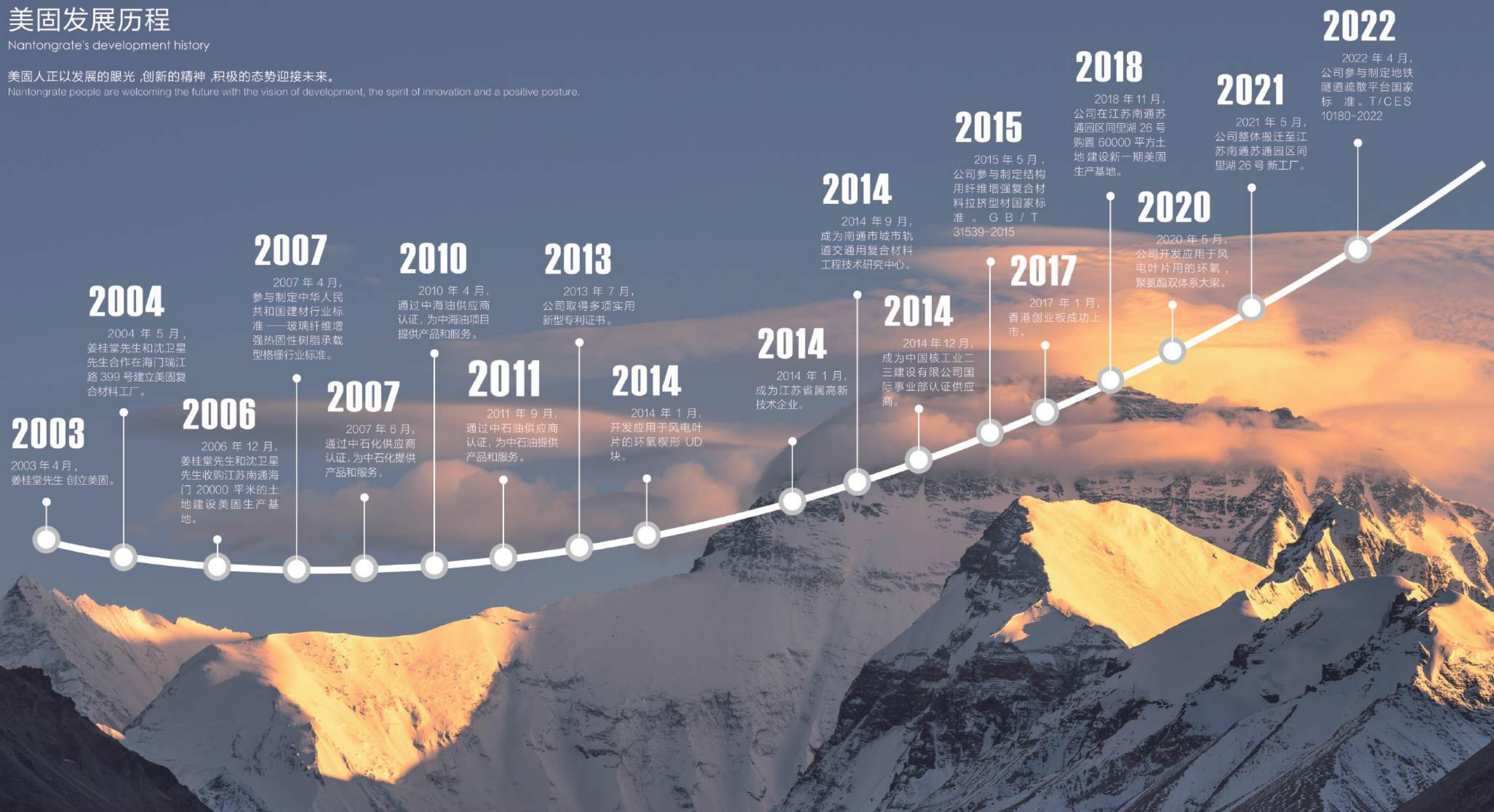
Nantong Composite people are waiting for your inquiries with the vision of development, the spirit of innovation and a positive attitude.

美国发展历程

Nantongrate's development history

美国人正以发展的眼光,创新的精神,积极的态势迎接未来。

Nantongrate people are welcoming the future with the vision of development, the spirit of innovation and a positive posture.



优秀的团队

Excellent team

美固建有一支年轻化、高素质,有凝聚力与创造力,不断进取的团队,为客户提供全方位的优质服务

Nantongrate has a young, well-educated, cohesive, creative and enterprising team to provide our customers with a full range of high-quality services.

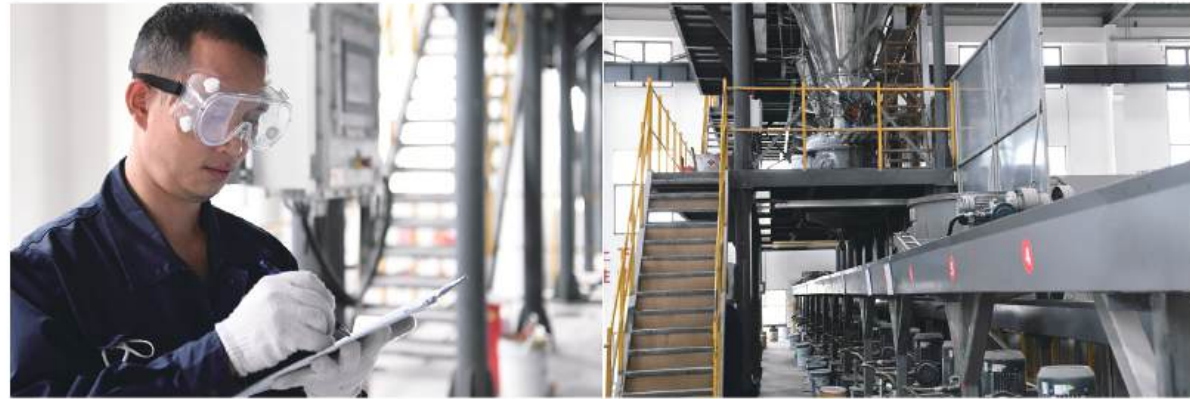


现代化的生产设备

Modern Production Equipments

美固拥有 60000 平方米的新型、环保的研发与生产基地，是一家专业的复合材料研发、制造的高新技术企业，为客户提供耐腐蚀环保复合材料综合解决方案和一体化服务。

Nantongrate has a modern, environmental friendly R&D and production factory of 60,000 SQM. We are a high-tech enterprise specializing in R&D and manufacturing of composite materials, providing customers with comprehensive solutions and integrated services for corrosion-resistant and environmental friendly composite materials.



一流的品质源于一流的质量控制

First class quality comes from first class quality control

美国新材料(南通)有限公司将产品质量视同企业的生命, 始终将追求一流品质作为企业宗旨。从原材料进厂到产品交付的全过程进行全面有序监控。

The first-class quality comes from the first-class quality control. Nantong Composite Material CO.,LTD regards the product quality as the life of the enterprise, and always takes the pursuit of first-class quality as the enterprise tenet. The whole process from raw materials entering the factory to product delivery shall be monitored comprehensively and orderly.

品质控制的四个步骤 Four steps of quality control

原材料进厂检测

Incoming inspection of raw materials

生产过程控制——巡检加自检

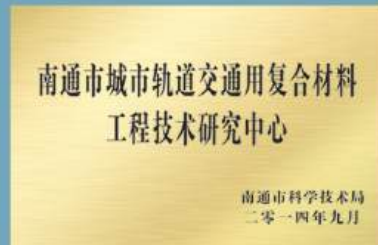
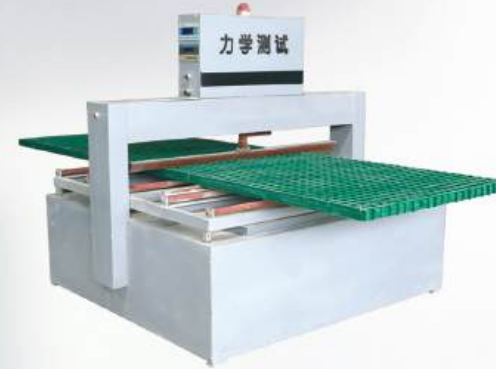
Production process control - patrol inspection plus self inspection

半成品检验及成品检测

Semi finished product inspection and finished product inspection

定期将产品送到国内外专业检测机构进行检测

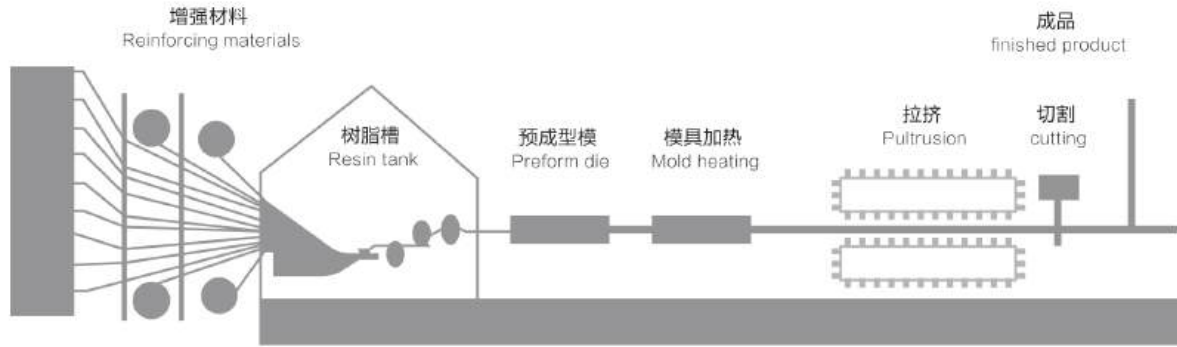
Semi finished product inspection and finished product inspection regularly send products to domestic and foreign professional inspection institutions for inspection



玻璃钢拉挤型材 FRP pultruded profiles

拉挤工艺是一种连续生产复合材料型材的方法，它是将纱架上的无捻玻璃纤维粗纱和其他连续增强材料、聚酯表面毡等进行树脂浸渍，然后通过保持一定截面形状的成型模具，并使其在模内加热固化成型连续出模，由此形成的拉挤制品的一种自动化生产工艺。

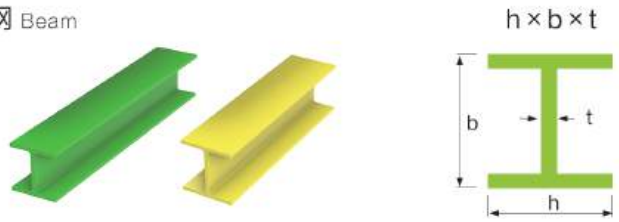
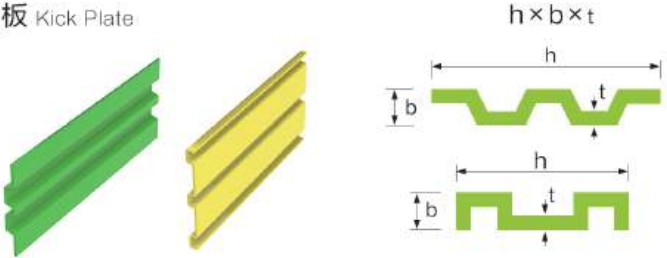
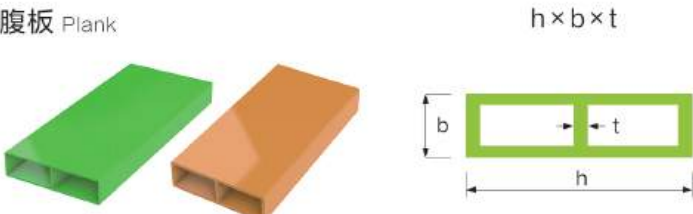
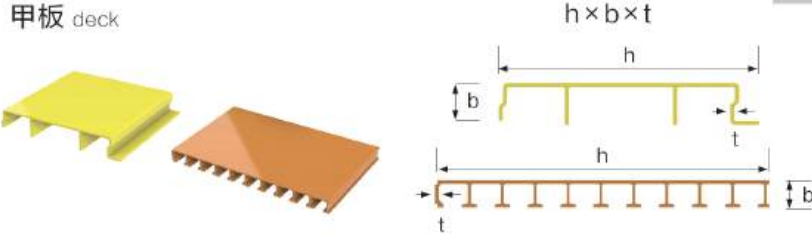
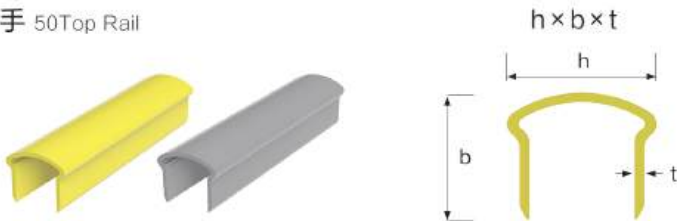
The pultrusion process is a method of continuous production of composite profiles. It is an automatic production process of pultrusion products formed by resin impregnation of untwisted glass fiber roving, other continuous reinforcement materials, polyester surface felt, etc. on the yarn frame, and then by maintaining a certain section shape of the molding mold, and making it heated and solidified in the mold to form a continuous mold.

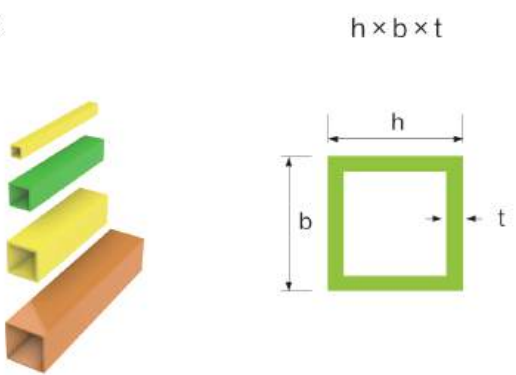
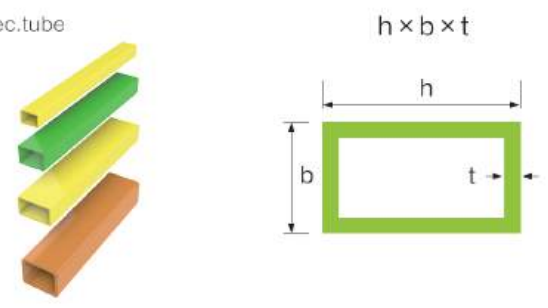
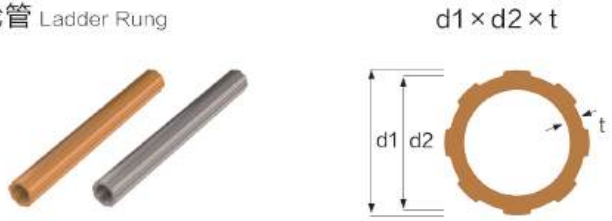
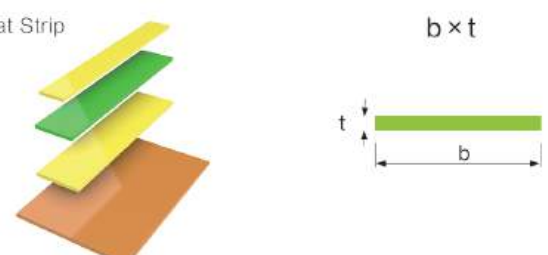



备注：不同截面尺寸的型材请致电美国新材料（南通）销售部。
Note: Please call Nantongrate Sales Department for profiles with different section sizes.

玻璃钢拉挤型材规格表 Specification of FRP pultruded profiles

型材名称 Profile name	规格示例 Specification example	规格型号 Specification and model (mm)	重量 weight (g/m)
角钢 Angle	$h \times b \times t$	40*40*4	578
		50*50*3.2	590
		50*50*5	903
		50*50*6.35	1154
		50*50*8	1396
		76*76*6.35	1762
		76*76*9.5	2600
		102*102*8	2970
		102*102*9.5	3480
		100*50*8	2158
槽钢 U-Channel	$h \times b \times t$	40*20*4	547
		50.2*27.2*4	733
		54.5*36*6*7	1400
		60*40*5	1269
		60*35*8	1710
		76*38*6.35	1699
		80*28*2.7*2.9	688
		102*30*6.36	1787
		102*44*6.36	2200
		116*65*7	3087
		152*42*6.35	2694
		152*42*9.5	3917
		152*45*8	3435
		203*56*9.5	5307
		250*70*12.7	8600
工字钢 Beam	$h \times b \times t$	25*15*4	400
		38*15*4	510
		102*51*6.4	2400
		152.4*76.2*6.35	3580
		203*102*12.7	9400
		254*127*12.7	11900

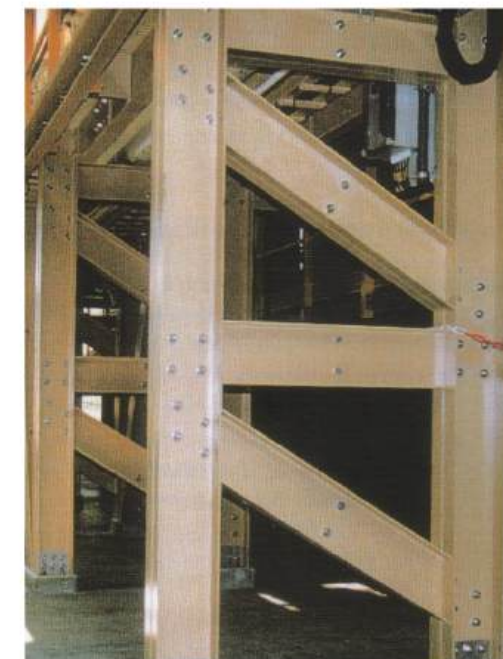
型材名称 Profile name	规格示例 Specification example	规格型号 Specification and model (mm)	重量 weight (g/m)
H 钢 Beam		76*76*6.35	2670
		102*102*6.35	3590
		102*102*8	4500
		152*152*6.36	5430
		152*152*9.5	8100
		203*203*12.7	14360
踢脚板 Kick Plate		100*12*3	890
		150*12.5*3	1129
		210*13*5	2380
空腹板 Plank		500*40*4.5	9500
甲板 deck		305*54*6	5400
扶手 50Top Rail		71*60*4.5	1425

型材名称 Profile name	规格示例 Specification example	规格型号 Specification and model (mm)	重量 weight (g/m)
方管 Sq. tube		25*25*3	506
		38*38*3	802
		50*50*3	1072
		50*50*3.5	1240
		50*50*4	1400
		50*50*5	1750
		50*50*6.4	2150
		63.5*63.5*4	1820
		63.5*63.5*5	2240
		76*76*6.35	3380
		101*101*4	2960
		101*101*4.5	3319
		101*101*6.35	4500
		101*101*8	5650
		120*120*5	4370
		矩形管 Rec.tube	
117.5*92.1*6*7	4910		
117.5*92.1*8*9	6300		
152*25*3*5	2109		
60*55*4	1587		
80*63*8	3921		
160*55*4	3560		
220*55*4	4760		
255*75*8	10431		
33.8*31*25.5	600		
齿轮管 Ladder Rung			
扁板 Flat Strip		40*5	400

型材名称 Profile name	规格示例 Specification example	规格型号 Specification and model (mm)	重量 weight (g/m)
圆棒 Solid Rod 	d	12.7	253
		16	402
		22	760
		24	905
		25.4	1014
		32	1608
		38	2268
		40	2513
		50	3927
		50.8	4053
圆管 Round Tube 	d × t	19*2.5	246
		23*3	358
		24*2.5	320
		25*2.1	287
		25.4*2.5	335
		28*3	448
		32*2.5	440
		32*3	519
		32*4	670
		38*3	626
		40*4	840
		50*4	1098
		50*5	1350
		60*6	1930
	70*6	2293	
	76*3	1300	
	76*6	2500	

备注：美国新材料（南通）还可以根据客户需求，开模定制特殊结构异性材。
Note: Nantongate can also customize special structural materials according to customer needs.

玻璃钢拉挤型材的应用 Application of FRP pultruded profiles



玻璃钢格栅 Frp Grating

玻璃钢(简称FRP)格栅是一种用玻璃纤维作增强材料,不饱和聚酯树脂为基体,经过特殊的加工复合而成的一种带有许多空格的板状材料,可广泛应用于石油化工、冶金、电子、电力、造纸、印染、电镀、船舶海工、市政工程等行业的地沟盖板、工作平台、设备平台、钻井平台、走道等,是腐蚀环境中的理想产品,同时也适用于民用建筑设施上。

按成型工艺的不同,玻璃钢格栅可分为玻璃钢模塑格栅和玻璃钢拉挤格栅。

Glass fiber reinforced plastic grating (FRP/GRP) is a kind of plate material with many meshes, which is made of glass fiber as reinforcement and unsaturated polyester resin as matrix through special processing and compounding. It can be widely used in trench covers, working platforms, equipment platforms, drilling platforms, walkways, etc. in petrochemical, metallurgy, electronics, power, paper making, printing and dyeing, electroplating, marine engineering, municipal engineering and other industries. It is an ideal product in corrosive environment and also suitable for civil construction facilities.

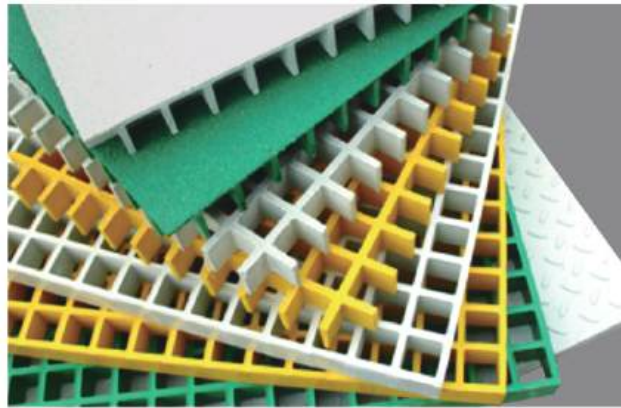
According to the different molding processes, FRP gratings can be divided into FRP molded gratings and FRP pultruded gratings.

模塑玻璃钢格栅 Molded Frp Grating

由玻璃纤维纵横交错编织,经不饱和聚酯树脂充分浸透,在金属模具内热固一次成型,产品由若干对称格子组成,结构牢固并且具有双向同性的力学特性。

Molded grating is manufactured by laying continuous glass fibers in the mould in the direction of vertical and horizontal, and the thoroughly wetted out with resin, layers by layers. When the weaving process is completed, the mould is heated to cure the panel.

After curing, the panel is ejected from the mould. The standard panel would have meniscus (concave) top surface. And process such as post applied grit could be bonded after a secondary operation. This continuous process produces an integral, one piece panel, which offers excellent corrosion resistance as well as bi-directional strength.



优点 Advantage

- 重量轻: 它的比重在 1.8 左右,其重量仅为钢材的 1/4,是铝材的 2/3;
- 强度高: 其强度是硬质聚氯乙烯的十倍,绝对强度大大超过铝材,达到普通钢材的水平;
- 安装方便: 自重轻,可以减少基础支撑,从而减少工程的材料成本。切割安装简便,无需动火及大型起吊设备,仅需少量人工及电动工具,使得安装成本也大为降低。
- 耐腐蚀: 它不锈、不霉、不腐、不需油漆,能耐许多气、液介质的腐蚀;
- 抗疲劳性: FRP 格栅有一些弹性,这使得长期在上面工作的人感到舒适,作为工作平台,减少了工作人员腿部和背部的紧张感,增加了工作的舒适度,从而提高工作效率,得到了人类工程学家的推荐;
- 经济性: 与普通碳钢比,FRP 格栅综合成本低,虽其一次性投资高于普通碳钢,由于它的使用寿命长,一般可使用二十年,且无需维护,因而其综合经济效益大大优于使用碳钢;
- 安全性: 在安装和使用 FRP 格栅的过程中不会因碰撞而产生电火花,尤其适合在易燃易爆的环境中使用,此外,具有防滑面层的格栅可防止滑倒,减少事故;

- Light weight: Its specific gravity is about 1.8, its weight is only 1/4 of steel and 2/3 of aluminum;
- High strength: Its strength is ten times that of rigid polyvinyl chloride, and its absolute strength is much higher than that of aluminum, reaching the level of ordinary steel;
- Easy installation: light weight can reduce the foundation support, thus reducing the material cost of the project. It is easy to cut and install, without hot work and large lifting equipment, and only requires a small amount of labor and electric tools, which greatly reduces the installation cost.
- Corrosion resistance: it is rust free, mildew free, corrosion free, does not require paint, and can withstand the corrosion of many gas and liquid media;
- Fatigue resistance: FRP grating has some elasticity, which makes people who work on it feel comfortable for a long time. As a working platform, it reduces the tension of the staff's legs and back, increases the comfort of work, and improves the work efficiency, which is recommended by the anthropologist;
- Economy: Compared with ordinary carbon steel, the comprehensive cost of FRP grating is lower. Although its one-time investment is higher than that of ordinary carbon steel, its service life is long, and it can be used for 20 years generally without maintenance, so its comprehensive economic benefit is much better than that of carbon steel;
- Safety: during the installation and use of FRP grating, electric sparks will not be generated due to collision, which is especially suitable for use in flammable and explosive environments. In addition, the grating with anti-skid surface can prevent slipping and reduce accidents;

模塑玻璃钢格栅规格 Specification of molded FRP grating

编号 number	厚度 thickness	规格型号 Specification (mm)	整板尺寸 Size of the whole panel (mm)	筋宽 bar width (上下)mm	重量 weight (kg/m ²)	开孔率 Open area
1	13	50×50×13	1220×3660	7/5	5.64	76%
2	13	50×50×13(DM)	1220×3660	10/9	7.46	68%
3	14	40×40(20×20)×14	1247×4047	7/5	9.3	42%
4	20	38×38×20	1220×4000	6/5	9.8	65%
5	22	40×40(20×20)×22	1527×4047	7/5	14.7	42%
6	22	40×40(8×8)×22	1527×4047	6/4.8	15.1	36%
7	25	50×50×25	1220×4000	7.5/6	11.5	78%
8	25	40×40×25	1247×4047	7/5	12.3	67%
9	25	38×38×25	1220×3660	7/5	12.3	70%
10	25	25×100×25	1220×3660	9.5/5	12.9	68%
11	25	25×100×25(HD)	1220×3660	13/5	15.67	67%
12	25	38×38×25(DM)	1220×3660	6/4.5	12	68%
13	25	38×38(19×19)×25	1220×3660	6.3/5	15	40%
14	30	40×40×30	1247×4047	7/5	14.6	67%
15	30	38×38×30	1220×3660	7/5	15.9	68%
16	30	52×52(25×25)×30	1000×4049	7/5	16	83%
17	30	40×40(20×20)×30	1247×4047	7/5	18.5	42%
18	30	40×40(8×8)×30	1527×4047	6/5	18.1	36%
19	38	50×50×38	1220×4000	7/5	16.5	80%
20	38	38×38×38	1525×4000	7/5	19.1	68%
21	38	38×152×38	1220×3660	7/5	15	74%
22	38	25×101.6×38	1220×3660	9&7	22.8	46%
23	38	25×152×38	1220×3660	12.7/9.5	20.6	63%
24	38	40×40(20×20)×38	1247×4047	7/5	23.7	42%
25	38	38×38(19×19)×38	1220×3660	7/5	25	40%
26	40	40×40×40	1527×4047	7/5	21	66%
27	50	50×50×50	1525×4000	7.5/5	21.7	71%
28	50	50×25×50(HD)	1220×1930	12&9.5	45.7	40%
29	60	38×38×60	1220×4000	12/9	50.4	46%
30	38	38×152×38	"571.5×3660 (楼梯踏步)"	7/5	17.23	78%
31	38	25×152×38	"565×3050 (楼梯踏步)"	7/5	23.1	62%
32	38	38×152×38	"647.7×3660 (楼梯踏步)"	7/5	17.23	78%

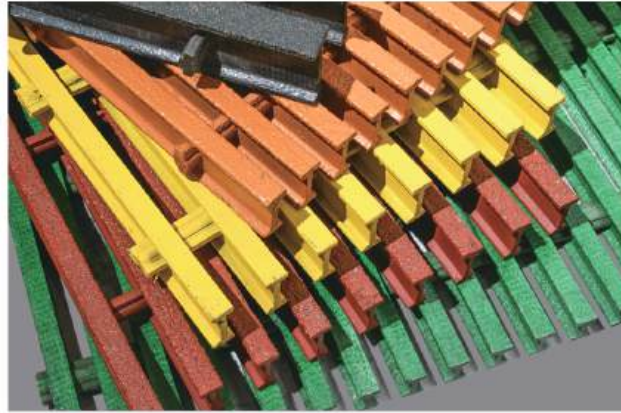
模塑玻璃钢格栅的应用 Application of Molded FRP Grating



拉挤玻璃钢格栅 Pultruded FRP grating

将纱架上的无捻玻璃纤维粗纱和其它连续增强材料进行树脂浸渍，通过保持一定截面形状的成型模具，在模内加热固化成型后连续出模，再组装而成，具有更高的单向强度。

The twistless glass fiber roving and other continuous reinforcement materials on the yarn frame are impregnated with resin, and formed by keeping a certain section shape of the molding mold, heating and curing in the mold, and then continuous molding, and then assembled, which has higher unidirectional strength.



拉挤格栅规格 Specification of pultruded grating

序号 Serial No.	型号 model	厚度 thickness (上下) mm	上下筋宽 bar width top/bottom (mm)	重量 weight (kg/m ²)
1	I-4010	25	15/15	16.78
2	I-5010	25	15/15	14.29
3	I-6010	25	15/15	11.81
4	I-40125	32	15/15	19.1
5	I-50125	32	15/15	17.4
6	I-60125	32	15/15	13.5
7	I-4015	38	15/15	21.38
8	I-5015	38	15/15	18.09
9	I-6015	38	15/15	14.8
10	T-1210	25	38/15	14.5
11	T-1810	25	38/15	14
12	T-3310	25	38/15	12.2
13	T-3810	25	38/15	11.2
14	T-3320	50	25/15	22.08
15	T-5020	50	25/15	17.58
16	I-40275	70	15/15	34
17	I-50275	70	15/15	29
18	I-60275	70	15/15	23.6

拉挤格栅的应用 Application of pultruded grating



树脂基体 Resin

树脂品种 Resin Type	说明 Note	适用场合 Application
乙烯基 Vinyl	耐强腐蚀 Strong corrosion resistance	酸、碱严重腐蚀环境 Severe acid and alkali corrosion environment
间苯 ISO	工业级耐腐蚀 Industrial corrosion resistance	中等程度酸碱腐蚀环境 Moderate acid and alkali corrosion environment
食品级 Food grade	食品级、耐腐蚀 Food grade, corrosion resistant	肉制品及其它食品加工厂 Meat products and other food processing plants
邻苯 ORTHO	耐普通腐蚀 Common corrosion resistance	一般腐蚀环境 General corrosive environment

玻纤纱 Fiberglass

品种 Type	规格型号 Specification and model	性能 performance
无碱粗纱 Alkali free roving	E-2400TEX	浸润性好, 产品具有优良的力学性能, 用于模塑工艺 With good wettability, the product has excellent mechanical properties and is used in molding process
无碱粗纱 Alkali free roving	E-9600TEX	浸润性优秀, 产品具有优良的力学性能, 用于拉挤工艺 With good wettability, the product has excellent mechanical properties and is used in pultrusion process

增强填料 Filler

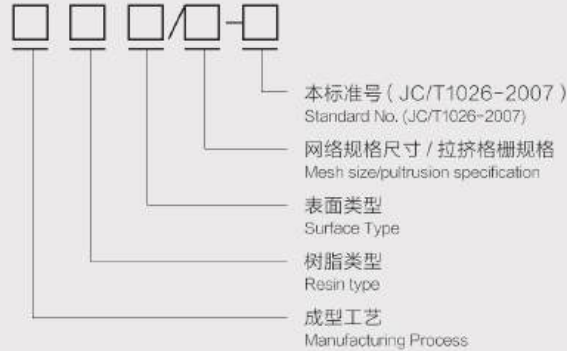
品种 Type	性能 performance	适合场合 Application
纯树脂 / 无填料 Pure resin/no filler	美观、透明性好 Beautiful and transparent	建筑装饰 Architectural decoration
氢氧化铝 Aluminium hydroxide	阻燃、氧指数 ≥ 26 Flame retardant, oxygen index ≥ 26	阻燃、抑烟环境 Flame retardant and smoke suppression environment
碳酸钙 calcium carbonate	增强、适度降低成本 Reinforcement, cost effective	无阻燃要求环境 Environment without flame retardant requirements

玻璃钢格栅选型 Selection of FRP grating

标记 sign

格栅根据成型工艺、树脂类型、表面类型、规格尺寸进行标记。

The grating shall be marked according to the molding process, resin type, surface type, specifications and dimensions.



成型工艺 Manufacturing Process

M 表示模塑成型

Indicates molded

P 表示拉挤成型

Indicates pultruded

表面类型 Surface Type

M 表示凹面型

Indicates concave

S 表示平面型

Indicates smooth

G 表示砂面型

Indicates grit surface

C 表示盖板型

Indicates covered plate type

O 表示其它型

Indicates other types

格栅采用模塑工艺,以乙烯基酯树脂为原材料,凹面型、网格规格尺寸(长×宽×高)为38mm×38mm×38mm,符合本标准的格栅标记为:MVM/38×38×38-JC/T 1026-2007。

格栅采用拉挤工艺,间苯树脂为原材料,平滑型、型号为I-4010,符合本标准的格栅标记为:PIS/I-4010-JC/T 1026-2007。

The grating produced by molded process, vinyl ester resin as raw material, concave type, grating size (long × wide × Height) is 38mm × 38mm × 38mm, the grating conforming to this standard is marked as MVM/38 × 38mm × 38mm, the grating conforming to this standard is marked as MVM/38 × thirty-eight × 38-JC/T 1026-2007.

The grating produced by molded process, isophthalic resin as raw material, smooth type, I-4010 model, and the grating conforming to this standard is marked as PIS/I-4010-JC/T 1026-2007.

树脂类型 Resin type

O 表示邻苯型不饱和聚酯树脂

Indicates orthophthalic Unsaturated polyester resin

I 表示间苯型不饱和聚酯树脂

Indicates isophthalic Unsaturated polyester resin

V 表示乙烯基酯树脂

Indicates vinyl ester resin

P 表示酚醛树脂

Indicates phenolic resin

树脂类型 Resin type

美国玻璃钢格栅耐腐蚀,但不同的树脂类型,有着不同的耐腐蚀能力。美国格栅有多种规格的标准板,不同规格的标准板,有不同的承载能力。在工程设计或施工选型时,需要根据环境、负载以及使用场合等要求,选择相应的树脂类型、格栅的规格、厚度及表面类型。在任何时候,美国都愿意为您提供技术支持,协助您设计、选材,以期您达到最佳的经济效益。

美国格栅有三种常用树脂类型:邻苯型、间苯型和乙烯基型。其价格与耐腐蚀能力成正比,所以要根据使用环境的腐蚀介质,查询性能介绍和耐腐蚀性能表选定最经济的树脂类型。

O 邻苯型:具有普通的耐腐蚀性能,可耐大气老化、海水腐蚀等,长期使用温度-50~60℃

I 间苯型(市政用):具有优良的耐腐蚀性能,可耐中等浓度无机酸碱各种盐类等环境,长期使用温度-50~90℃

V 乙烯基型(化工用):具有优异的耐腐蚀性能,可耐酸、碱、盐、溶剂、或酸碱交替等很恶劣的腐蚀环境,长期使用温度-50~110℃

NANTONGRATE gratings can offer different corrosion resistance with various resin options. With various specification, our gratings can also offer the suitable loading capacity required for the project. During the engineering design or construction type selection, the corresponding resin type, grating specification, thickness and surface type shall be selected according to the requirements of environment, load and application occasions. At any time, Nantongrate is willing to provide you with technical support to help you design and select materials, so that you can achieve the best economic benefits.

NANTONGRATE gratings offer three common resin types: O-rhophthalic Unsaturated polyester resin, I-isophthalic Unsaturated polyester resin and vinyl ester resin. The more expensive resin type with better corrosion resistance. Our professional engineer and sales advisor will give you the best recommendation to your needs in the most economic way.

O -Ortho resin: It has common corrosion: it has common corrosion resistance, can resist atmospheric aging, seawater corrosion, etc., and long-term service temperature is -50-60 °C

I -ISO resin: It has excellent (municipal use): it has excellent corrosion resistance, and can withstand medium concentration of inorganic acid and alkali, various salts and other environments. Long term use temperature is -50-90 °C

V Vinyl Ester resin: It has excellent (for chemical industry): it has excellent corrosion resistance, and can resist acid, alkali, salt, solvent, or acid alkali alternative and other harsh corrosion environments. The long-term service temperature is -50-110 °C

表面形式选择 Surface selection

根据使用场合的要求,选择美国玻璃钢格栅的表面类型,美国玻璃钢格栅分为普通型和盖板型。
elect different surface according to the different applications. We have Normal type(open mesh) and Covered type.

普通型 Normal Type

(1) 凹面(自然形成):凹面格栅基本防滑。

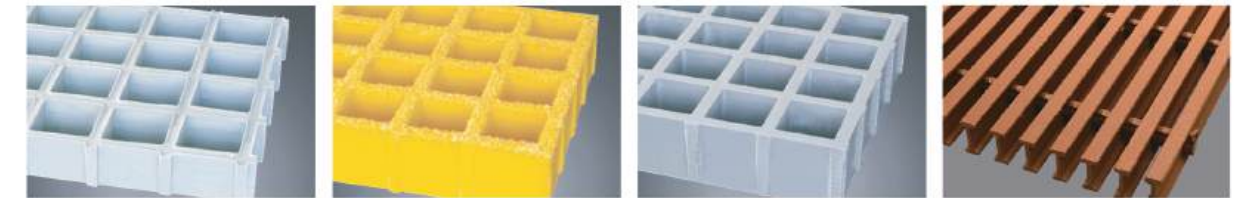
(2) 表面铺砂:铺砂格栅特别防滑。

(3) 光面(表面磨平):光面格栅不防滑,一般用于装饰及其它需要光面的场合。

1) Concave top: The concave top for normal level anti-slip requirement.

2) Grit top: The grit top for high level anti-slip requirement.

3) Smooth top (polished surface): Smooth top is not anti-slip, generally used for decoration and other occasions requiring smooth surface.



盖板型 Covered Type

用于不能有孔,防液体滴漏、气体挥发或对孔有特殊要求的场合。

(1) 光面盖板格栅:表面不防滑,易除尘。

(2) 石英砂面盖板格栅:砂面盖板格栅防滑性最好。

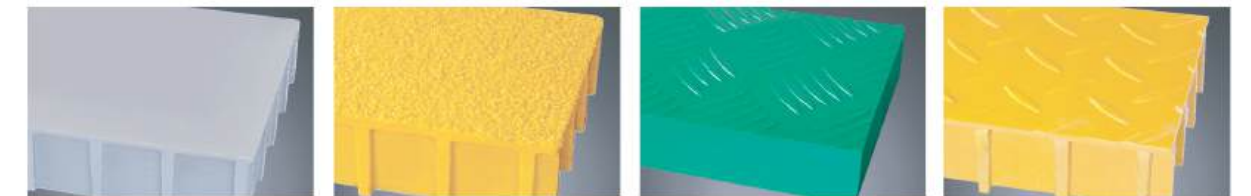
(3) 花纹盖板格栅:花纹盖板格栅防滑性略差,但更美观。

It is used for the occasions not allow to have holes, liquid leakage, gas volatilization or other special requirements.

1) Smooth covered gratings: the surface is not for anti slip, easy to remove the dust.

2) Grit covered gratings: with best anti-slip feature.

3) patterned covered gratings: with medium anti-slip feature and more beautiful.

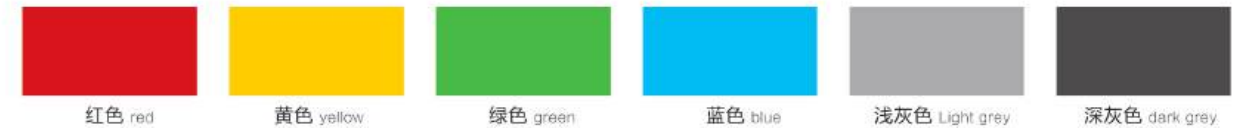


※ 盖板格栅也可根据要求打孔,做成滤板等。 According to requirements, Covered gratings can be make into filter plates.

颜色选择 Color Selection

美国公司标准色有绿色、黄色、灰色,建议您根据不同的使用环境或场合选择不同颜色的美国格栅,以使工作场所更具人性化,另外本公司可根据您的要求提供用户自选色的产品。

Nantongrate's standard colors are green, yellow and grey. We suggest the client choose the color according to the different occasions to make the workspace more humanized. We can also offer customized color to your special requirements.



USCG 酚醛格栅 USCG Phenolic grating

USCG 是 United States Coast Guard 美国海岸警卫队缩写, USCG 酚醛格栅因通过美国海岸警卫队的 L3、L2 防火测试而得名。酚醛格栅使用了性能优异的酚醛树脂, 并经过更为严格的工艺制作而成, 具有重量轻、强度高、耐腐蚀、高阻燃、可定制颜色、安装简单、免维护、抗冲击、和抗老化等特性。

美国海岸警卫队认定, 此类格栅可以在以下场所使用: 海洋石油平台、人行通道、船甲板、煤矿等紧急逃生通道或救生场所。

USCG is the abbreviation of the United States Coast Guard. The USCG phenolic grating is named after passing the L3 and L2 fire tests of the United States Coast Guard. The phenolic grating uses phenolic resin with excellent performance and is made by more strict process. It has the characteristics of light weight, high strength, corrosion resistance, high flame retardancy, customizable color, simple installation, maintenance free, impact resistance, aging resistance, etc.

The United States Coast Guard has determined that such gratings can be used in the following places: offshore oil platforms, pedestrian passages, ship decks, coal mines and other emergency escape routes or life-saving places.



地铁疏散平台系统 Metro evacuation platform system

地铁作为城市公共交通的重要组成部分, 其安全性直接关系到乘客的生命安全, 列车在隧道内突遇输电系统故障、火灾事故、恐怖袭击等意外紧急情况时, 应考虑有足够的逃生空间和通畅的逃生通道配置。

复合材料地铁疏散平台是以酚醛树脂为基体材料, 玻璃纤维无捻粗纱为增强材料, 经特殊拉挤工艺制成, 具有高强度、高阻燃、低烟密度、低毒性、耐腐蚀、抗老化、重量轻, 表面防滑, 还有导热系数低、绝缘性能好、抗紫外线、抗冲击等特性。采用复合材料地铁疏散平台, 安装容易、施工周期短、免维护、对隧道壁影响低。

复合材料疏散平台主要由平台面板、横梁、斜梁、扶手、专用连接件组成。平台面板通过支架支撑并固定在隧道壁, 高度与车厢地板持平, 只要车门一打开, 逃生乘客即可以一步踏上这条逃生通道。

As an important part of urban public transport, the safety of subway is directly related to the life safety of passengers. When the train encounters unexpected emergencies such as power transmission system failure, fire accident, terrorist attack, etc. in the tunnel, it should consider to have sufficient escape space and unobstructed escape channel configuration.

The composite subway evacuation platform is made of phenolic resin as the matrix material and glass fiber roving as the reinforcement material through a special pultrusion process. It has the characteristics of high strength, high flame retardancy, low smoke density, low toxicity, corrosion resistance, aging resistance, light weight, anti-skid surface, low thermal conductivity, good insulation, UV resistance, impact resistance, etc. The composite material subway evacuation platform is used, which is easy to install, short in construction period, maintenance free, and has low impact on the tunnel wall.

The composite evacuation platform is mainly composed of platform panel, beam, inclined beam, handrail and special connector. The platform panel is supported and fixed on the tunnel wall through the bracket, and its height is equal to the floor of the compartment. As soon as the door is opened, the escape passengers can step onto this escape passage.



USCG 酚醛格栅性能指标 Performance of USCG phenolic grating

项目 ITEM	特性 Characteristic	测试标准 Test standards
阻燃性 Flame retardancy	燃烧速率 ≤ 10 Combustion rate ≤ 10	ASTM -E84
防火耐烧蚀性 Fire resistance and ablation resistance	格栅经过 1 小时匀速升温到 927℃ 明火灼烧, 仍然能保持结构完整性 The grating can still maintain structural integrity after being heated to 927 °C at a constant speed for 1 hour and burned with open flame.	ASTM -119
防火自灭性 Fire self extinguishing	满足 ASTM D-635 的自灭要求 Meet the self extinguishing requirements of ASTM D-635	ASTM D-635
承载性能 Bearing capacity	格栅经过室温 1 小时匀速升温到 927℃ 明火灼烧后, 承载满足美国海岸警卫队规定的 L 2 级承载要求。 After being heated to 927 °C by open flame at room temperature for 1 hour at a constant rate, the load bearing capacity of the grating meets the L2 level load bearing requirements specified by the United States Coast Guard.	ASTM -119
耐腐蚀 Corrosion resistance	良好的耐腐蚀性 Good corrosion resistance	
使用温度 Operating temperature	最高使用温度 180℃ Maximum operating temperature: 180 °C	

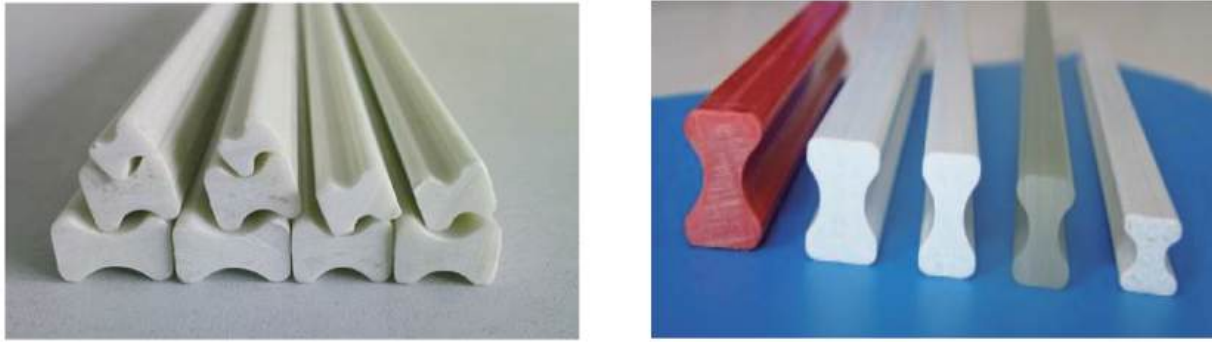
复合材料地铁疏散平台的各项性能 Properties of composite subway evacuation platform

测试项目 Test Item	指标 Index	测试标准 Test standards
燃烧增长速率指数 (FIGRA) Combustion growth rate index (FIGRA)	≤ 120 W/s	GB/T 20284-2006
600 秒内总放热量 (THR600s) Total heat release in 600s (THR600s)	≤ 7.5 MJ	GB/T 20284-2006
火焰横向蔓延长度 (LFS) Flame transverse spread length (LFS)	< 试样边缘	GB/T 20284-2006
燃烧热值 (PCS) Heat of combustion (PCS)	≤ 3.0 MJ/kg	GB/T 14402-2007
烟气生成速率指数 (SMOGRA) Smoke generation rate index (SMOGRA)	≤ 30 m ² /s ²	GB/T 20284-2006
600 秒内总烟量 (TSP600s) Total smoke volume in 600 seconds (TSP600s)	≤ 50 m ²	GB/T 20284-2006
燃烧滴落物 / 微粒 Combustion Drops/Particulates	600 秒内无, d0/t1 级	GB/T 20284-2006
产烟毒性、级 Smoke toxicity, grade	达到 ZA 1	GB/T 20285-2006
沿纤维方向弯曲强度 Bending strength along the fiber direction	≥ 280 MPa	GB/T 1449-2005
沿纤维方向弯曲弹性模量 Flexural modulus of elasticity along the fiber direction	≥ 2 × 10 ⁴ MPa	GB/T 1449-2005
耐水试验: 45℃, 8 小时后, 弯曲强度保留率 Water resistance test: 45 °C, bending strength retention after 8 hours	> 80%	GB/T 2575-1989
热变形温度 Thermal deformation temperature	≥ 200°C	GB/T 1634.2-2004
燃烧等级 Combustion grade	A2 级	GB 8624-2006

楔形块 (UD块) Wedge block (UD block)

叶片根部预埋玻璃纤维拉挤楔形块 (简称 UD 块) 是专为风机叶片根部开发的拉挤型材。由我公司与美国陶氏化学合力研究开发, 是以环氧树脂为基体材料, 玻璃纤维无捻粗纱为增强材料, 采用拉挤工艺制成。该产品应用于风电叶片的叶根, 通过对叶片叶根的预埋来提高叶片的强度和稳定性, 此产品具有高拉伸强度、高剪切强度和与叶片同体系等特点。该产品能够克服采用手工铺设预埋螺栓真空灌注导致的缺陷, 例如易出现褶皱, 气泡等质量缺陷问题。

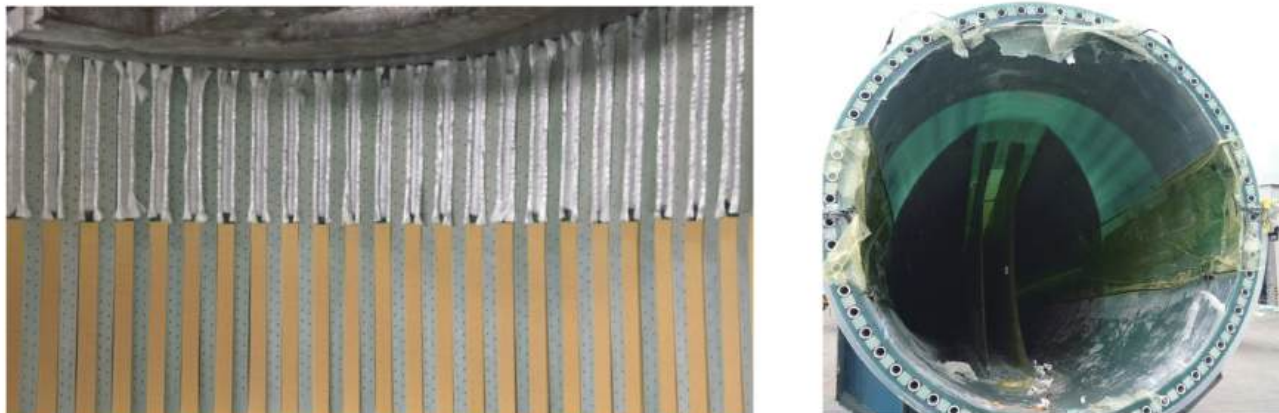
The glass fiber pultrusion wedge block (UD block for short) embedded in the blade root is a pultrusion profile specially developed for the fan blade root. Developed by our company and Dow Chemical, it is made of epoxy resin as the matrix material and glass fiber roving as the reinforcement material by pultrusion process. This product is applied to the blade root of wind power blade. The strength and stability of the blade are improved by embedding the blade root. This product has the characteristics of high tensile strength, high shear strength and the same system with the blade. The product can overcome the defects caused by manual laying and vacuum pouring of embedded bolts, such as the quality defects such as wrinkles and bubbles.



性能指标 Properties

性能 performance	方向 direction	单位 unit	测试依据 Test standard	指标值 test result
拉伸强度 tensile strength	0° (X方向)	Mpa	ISO 527-5: 2009	≥ 600
拉伸模量 Tensile modulus	0° (X方向)	Gpa		≥ 41.5
压缩强度 compressive strength	0° (X方向)	Mpa	ISO 14126: 1999	≥ 600
压缩模量 Compressive modulus	0° (X方向)	Gpa		≥ 41.5
剪切模量 shear modulus		Gpa	ASTM D7078	≥ 4
玻璃化转变温度 Glass transition temperature		°C	ISO 11357-2: 1999	≥ 95
胶含量 Gum content		%	ISO 1172: 1996	≥ 20
拉伸剪切强度 Tensile shear strength		Mpa	BS EN 1465-2009	≥ 25

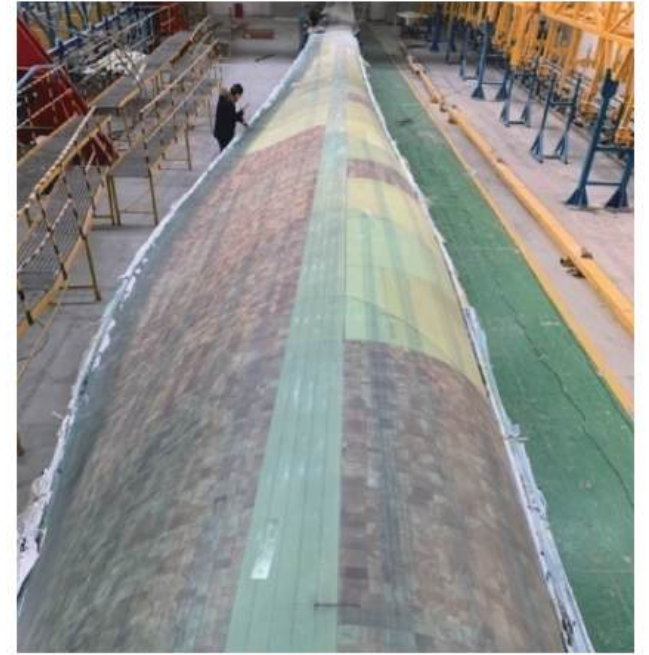
楔形块 (UD块) 的应用 Application of wedge block (UD block)



拉挤大梁 Pultruded girder

叶片大梁用玻璃纤维板材 (简称玻璃纤维拉挤大梁) 是专为风机叶片主梁开发的拉挤板材。玻璃纤维通过胶槽和环氧树脂充分浸润, 然后通过预成型板挤胶、束型后进入拉挤模具中加热固化, 再通过后固化炉提高固化度, 最后通过牵引、收卷成具有一定长度的成品。玻纤拉挤板材具有玻纤含量高、模量 / 强度提升明显 (VS 玻纤织物)、总成本低 (VS 碳纤), 可降低风电大梁约 10% 重量, 在大尺寸风电叶片的轻量化、低成本设计具有重要意义。

Glass fiber plate for blade girder (referred to as glass fiber pultrusion girder) is a pultrusion plate specially developed for fan blade girder. The glass fiber is fully soaked through the glue tank and epoxy resin, and then extruded through the preformed plate, bundled into the pultrusion mold for heating and curing, and then through the post curing furnace to improve the curing degree. Finally, it is pulled and rolled into a finished product with a certain length. The glass fiber pultruded plate has high glass fiber content, obvious modulus/strength improvement (VS glass fiber fabric), low total cost (VS carbon fiber), and can reduce the weight of wind power girder by about 10%. It is of great significance in lightweight and low integration design of large size wind power blades.



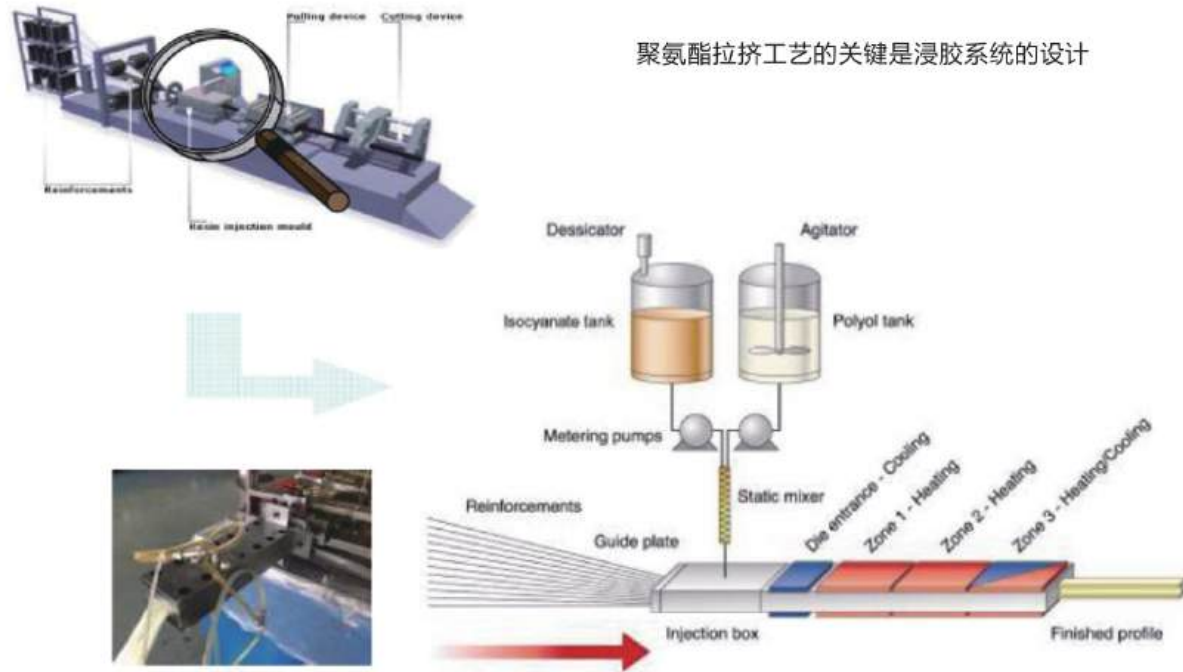
性能指标 Properties

序号 No	项目 Test item	测试值 Test value	测试标准 Test standards	备注 remarks
1	0° 拉伸强度 0° tensile strength	1528Mpa	ISO 527-5	最小值 1456Mpa
2	0° 拉伸模量 0° tensile modulus	63.6Gpa		
3	0° 压缩强度 0° compression strength	1506Mpa	ISO 1426	最小值 1456Mpa
4	0° 压缩模量 0° compression modulus	64.7Gpa		
5	90° 拉伸强度 90° tensile strength	54.1Mpa	ISO 527-5	最小值 52.54Mpa
6	90° 拉伸模量 90° tensile modulus	17.2Gpa		
7	90° 压缩强度 90° compression strength	171Mpa	ISO 14126	最小值 166.3Mpa
8	90° 压缩模量 90° compression modulus	20.0Gpa		
9	V 型剪切强度 V-shaped shear strength	67.9Mpa	ASTM D 7080	最小值 67.40Mpa
10	V 型剪切模量 V-type shear modulus	5.5Gpa		
11	层间剪切强度 Interlaminar shear strength	67.3Mpa	ISO 14130	最小值 66.57Mpa
12	拉拉疲劳性能 (m 值) Tensile fatigue property (m value)	8.7	ISO 13003	百万次数值

聚氨酯树脂体系产品 Polyurethane resin system products

聚氨酯树脂体系是一种新的拉挤工艺，聚氨酯两种组分——异氰酸酯和多元醇，通过专用的注料机按照一定的比例打出并充分混合后进入注料盒，在注料盒中玻璃纤维和聚氨酯树脂充分浸润后一起进入拉挤成型模具，在一定的温度下固化成型并通过牵引连续拉出型材。

The polyurethane resin system is a new pultrusion process. The two components of polyurethane, isocyanate and polyol, are pumped out by a special injection machine according to a certain proportion and fully mixed before entering the injection box. After the glass fiber and polyurethane resin in the injection box are fully soaked, they enter the pultrusion mold together, solidify at a certain temperature, and pull out the profiles continuously.



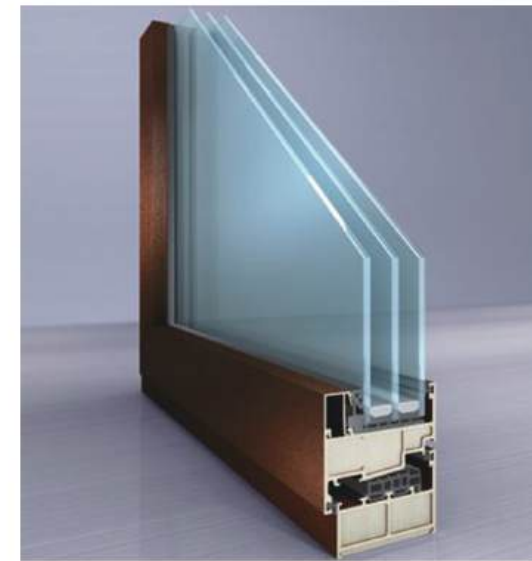
性能指标 performance index

测试项目 Test items	单位 unit	数值 value	测试标准 Test standards
弯曲模量 Bending modulus	Gpa	50	ISO 14125
弯曲强度 bending strength	Mpa	1500	ISO 14125
拉伸强度 tensile strength	Mpa	1200	ISO 527-5
拉伸模量 Tensile modulus	Gpa	50	ISO 527-5
导热系数 thermal conductivity	w/m · k	0.26	ASTM C518
线性热膨胀系数 Coefficient of linear thermal expansion	10 ⁻⁶	7.0	GB/T 2572
热变形温度 Thermal deformation temperature	℃	240	GB/T 1634.3
巴氏硬度 Barcol hardness		75	GB/T 3854

优势及应用 Advantage & Application

- 具有更高的热变形温度和巴氏硬度；
- 耐疲劳性能更好；
- 具有更好的握钉力，可以直接使用自攻螺钉；
- 生产过程没有烟雾和气味产生，零 VOC；
- 产品横向强度高；
- 产品尺寸稳定性高，收缩率更小；
- 可以使用纯纱拉挤比较复杂的产品截面，如门窗型材；
- 可以提供更佳的产品表面，如需进行喷涂处理，无需表面处理即可进行喷涂的卓越性能；
- Higher thermal deformation temperature and Barcol hardness;
- Better fatigue resistance;
- With better nail holding force, self tapping screws can be directly used;
- No smoke and odor generated during production, zero VOC;
- High transverse strength of the product;
- High dimensional stability and smaller shrinkage;
- Complex cross section can be produced by pure fiberglass, such as door and window profiles;
- It can provide better product surface. If spraying treatment is required, it can be sprayed without surface treatment;

- 聚氨酯体系已被广泛应用于门窗、桥架、太阳能边框、运动器材等领域产品的
- Polyurethane system has been widely used in doors and windows, bridge, solar energy frame, sports equipment and other fields.



有色金属
non-ferrous metal

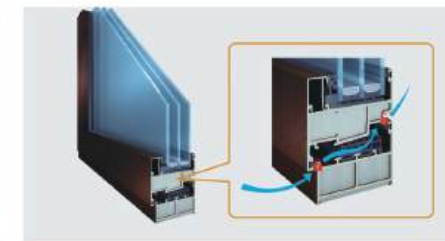
石油化工
petrochemical industry

船舶海工
Ship and marine engineering

轨道交通
Rail Transit

风电环保
Wind power environmental protection

市政公用
Municipal public utilities



美固，专注于耐腐蚀环保复合材料的综合解决方案

Nantongrate, focused on corrosion environment comprehensive solution of the composite material

美固新材料(南通)有限公司将产品质量视同企业的生命, 始终将追求一流品质作为企业宗旨。
从原材料进厂到产品交付的全过程进行全面有序监控。

The first-class quality comes from the first-class quality control. Nantong Composite Material CO.,LTD regards the product quality as the life of the enterprise, and always takes the pursuit of first-class quality as the enterprise's tenet. The whole process from raw materials entering the factory to product delivery shall be monitored comprehensively and orderly.

